

by Sarah E. Smith

Less energy, more fish at Idaho fish hatchery

Energy efficiency and water supply upgrades transform an antiquated Idaho fish hatchery into a national model for the 21st century

Millions fewer kilowatt-hours in and millions more fish out — that’s the new measure of success at Dworshak National Fish Hatchery near Orofino, Idaho.

An unusual five-way partnership has created a win-win-win-win-win situation at one of the most remote and spectacular locations in the Federal Columbia River Power System. Together, a state, a tribe, and three federal agencies leveraged their diverse know-how and resources to save valuable energy and invaluable fish runs, originating in North-Central Idaho and fanning out across the region.

Chairman Silas Whitman of the Nez Perce Tribe, which co-manages the hatchery, says the unique collaboration is an example of “the cycle of life...and an effort I hope continues to build and build and build.”

Administrator Elliot Mainzer of Bonneville Power Administration, which funded about \$600,000 in improvements, says the cooperation behind the project became “a positive feedback mechanism in which one good act spurs another good act, and creates a cycle of virtue.”

Robyn Thorson, Pacific Region director of the U.S. Fish & Wildlife Service (USFWS), which manages the hatchery with the tribe, says it’s “a big story of place, people, and partnership.”

Lt. Col. Andrew Kelly of the Walla Walla District of the U.S. Army Corps of Engineers, which owns the dam, says, “This project management’s collaborative approach to problem-solving serves as a model for us all to follow.”

Dworshak Dam and National Fish Hatchery sit at the confluence of the Clearwater River and its North Fork, a place so propitious, people have gathered there to fish since time immemorial. On one riverbank lies the heritage site where the Nez Perce helped hungry members of the Lewis and Clark expedition build five dugout canoes for its journey to the Pacific in the fall of 1805. Two centuries later,



Twenty-first century teamwork and problem solving elevated the performance of the Dworshak National Fish Hatchery, managed by the Nez Perce Tribe and U.S. Fish and Wildlife Service, and earned it the Department of Interior’s 2013 Environmental Achievement Award. All photos by Tom Osborn, BPA.

the synergistic setting has continued to provide a rich confluence of intergovernmental cooperation and opportunity.

Within the hatchery, tiny salmon flash around the raceways like silver streaks. Within the dam, electrons fly to the grid from three hydroelectric generators totaling 400 megawatts.

Thanks to improvements paid for by BPA ratepayers since 2011, greater quantities of fish and electricity alike have been returned to the region. The energy efficiency and related refurbishments have enabled the hatchery to roughly double the number of fish it raises while using about half the water and energy. The project earned the Department of Interior’s Environmental Achievement Award for 2013.

The upgrades at Dworshak fit into the larger effort by BPA and its federal partners to rebuild threatened and endangered fish runs and to mitigate for effects of the 31 federal dams in the Columbia River Basin. This year’s forecasts for fish returns to the mouth of the Columbia are generally on the rise. They include an estimate of 227,000 spring Chinook — exceeding the 10-year average — as well as 1.5 million fall Chinook; 638,000 coho; 281,000 steelhead; and 347,000 sockeye salmon.

Continued on page 14



At an April celebration and tour of the hatchery, BPA Administrator Elliot Mainzer marvelled at the synergies arising from the shared efforts of a tribe, a state, and three federal agencies that produced one megawatt of energy efficiency and helped the hatchery meet its targets for fish production.

The hatchery was built in 1969 to offset the impact on North Fork steelhead from construction of the third-tallest dam in the U.S. — at 717 feet, far too high for fish passage. It shoulders a hefty roster of responsibilities every year: to rear and release 3.6 million young fish, or smolts, including 2.1 million summer steelhead and 1.5 million spring Chinook, fulfilling targets under the Lower Snake River Compensation Plan and FCRPS objectives. It also produces 300,000 coho through a tribal program.

Despite remaining one of the world's largest combined producers of steelhead and salmon, the hatchery had grown antiquated by the 21st century. A mostly analog plant in a digital world, it faced problems with aging equipment and water supply, creating major obstacles to meeting its yearly fish-production targets.

BPA's dual expertise — reflecting its history of supporting innovative energy-efficiency projects and operating one of the largest fish and wildlife programs in the world — found a fruitful outlet at Dworshak. For a relatively modest investment, the partnership was able to generate dramatic savings in electricity and water use, said Brad Miller of BPA's Energy Smart Reserved Power program. The efficiency measures resulted in \$431,000 in direct cost avoidance to BPA in both 2011 and 2012, meaning the project paid for itself in less than 17 months while helping the

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hatchery meet its production targets. BPA also funds the power share of operations and maintenance costs of the hatchery, about \$3.2 million in fiscal year 2013.

At an April celebration, BPA executives joined partners on a tour. They learned how \$600,000 in refurbishments had already produced an average megawatt of energy savings — “with another megawatt on the way,” says BPA Energy Efficiency Engineer Tom Osborn.

Visitors viewed incubation trays in which fertilized eggs develop eyes (or “eye up”) in two weeks. By doubling the number of trays to 1,856 with BPA funding, the hatchery was able to incubate many more eggs using lower water temperatures on a less-challenging schedule. That meant operating energy-hungry boilers less, while greatly increasing the numbers of healthy fish released for the 500-mile journey to the Pacific Ocean.

Partnering with the nearby Clearwater Hatchery, which is operated by the Idaho Department of Fish and Game, the hatchery accessed a superior water supply from the reservoir behind Dworshak Dam, saving energy and reducing disease. The reservoir water is not only cleaner than water pumped up from the river, but flows down at a temperature closer to ideal for rearing fish.

“The biological gains and energy savings we made by being able to stay on reservoir water are fantastic,” said Scott Bettin of BPA's Environment, Fish and Wildlife group.

The hatchery also replaced pumps, pairing them with variable frequency drives for more efficiency. “We're using less horsepower to move the same amount of water,” Osborn said.

The entire project reflects a more nuanced and integrated way of operating.

“The level of cooperation achieved among the partners would have been almost unimaginable only a few years ago,” says USFWS Aquatic Engineer Jack Christiansen. “And it has created a new model that is directly applicable to other fish hatcheries nationwide.” **NWPPA**

Sarah E. Smith is a policy writer in the Public Affairs Department at Bonneville Power Administration. She can be contacted at sesmith@bpa.gov or (503) 230-5272.